CATALOG
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SHORT
FORM
CATALOG

MASTER SPECIALTIES

WORD
INDICATOR
LIGHTS

1966

INDICATING
FUSE HOLDERS

ILLUMINATED
PUSHBUTTON
SWITCHES

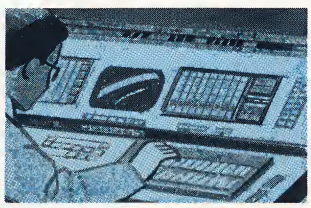
PILOT
LIGHTS

ELECTRONIC
CONTROL
COMPONENTS

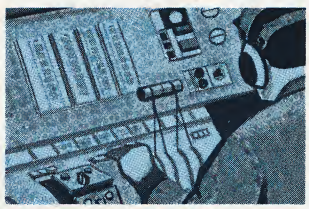
Master Specialties Company and its products... MSC

Master Specialties Company was formed in 1942 to specialize in the development and production of caution and warning systems, word indicator lights, and illuminated push-button switches. Concentration in this field lead to the development of many pace-setting innovations for the aircraft industry and, later, for the aerospace programs. Today, the company produces a broad line of devices for information display and control, including high quality, precision units for industrial and commercial equipment and instrumentation.

Noteworthy among the principles pioneered by Master Specialties was the design of units that permitted quick, easy access to lamps, filters and legends from the panel front, without the use of tools of any kind. Prior to this concept, relamping tools or complete removal of the assembly was required to replace defective lamps. The development



of Master Test and Master Dimming circuitry provided verification and optimum visibility to aircraft instrument panels. These typical design features have since become

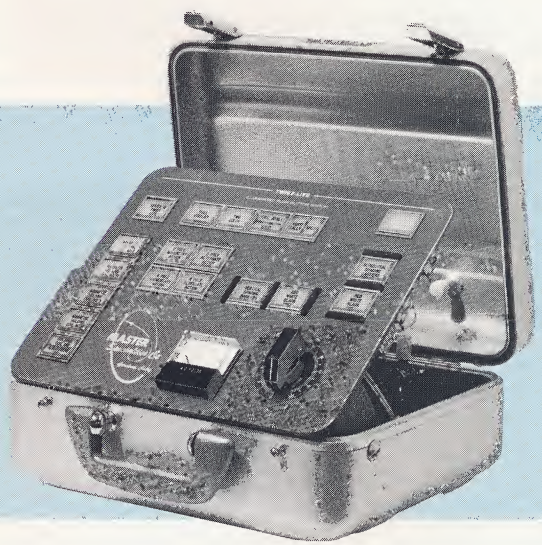


standards of performance for similar devices produced by other manufacturers, and are the forerunners to an ever expanding Master Specialties Company line of equally significant products.

Coupled with unique design, sound engineering and fine craftsmanship make the Master Specialties line a qualified source for application to any project requiring extra-margin performance. The pages that follow provide a brief description of the basic line. Detailed data on each series is available from regional offices situated in key areas throughout the nation. You are invited to inquire about the advantages these devices hold for your present or future applications.

See Master Specialties Devices *in operation* in your plant or office!

Master Specialties regional offices maintain a complete series of operational demonstrators for each of the series listed in this catalog. A Master Specialties field engineer near you will be happy to bring a unit to your office for a first hand examination of the product features. His experience gained while working with many of the leading aerospace and industrial design teams can be brought to bear on your project. He'll be happy to assist!



SEE THE BACK COVER FOR A LISTING OF MASTER SPECIALTIES COMPANY REGIONAL OFFICES NEAR YOU.

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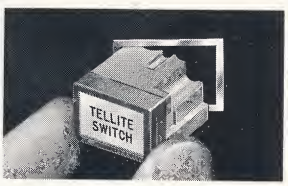
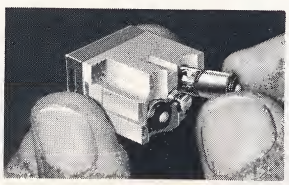
THE FOUR-POLE/DOUBLE THROW ILLUMINATED PUSHBUTTON SWITCH FOR WIDE VERSATILITY IN LIMITED SPACE...

Series 90E Miniature Tellite Switch!

The versatile Series 90E Miniature Tellite Switch is a two-lamp, flush mounted pushbutton switch designed to offer broad capabilities in minimum space. It is ideally suited for application to control panel for computers, control systems and instrumentation. The unit is comprised of a stainless steel housing and a molded plastic light capsule which, when assembled, occupies half the volume of conventional units of comparable capabilities. Neat, and trim in appearance, these units offer a flush-mounted front lens in framed or full-view styles... offer operation as a word indicator for design compatibility in console layout. Even illumination of the rectangular front lens is assured through projected color achieved by two standard lamps and removable color filters. For complete specifications, request Catalog 2008.

NO TOOLS REQUIRED FOR QUICK, EASY RELAMPING!

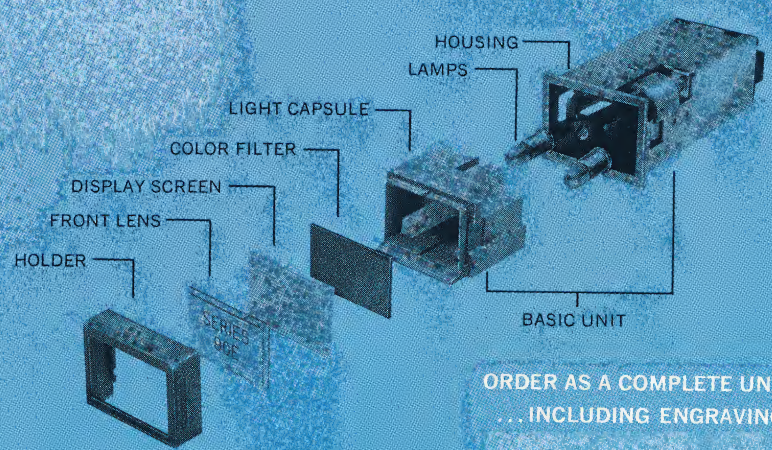




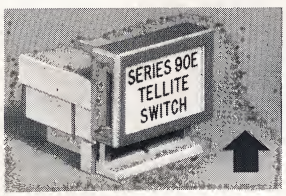
Replacement of defective lamps can be easily accomplished from the panel front... without tools of any kind! The light capsule, which holds the lamps and front lens assembly, is held in place in the unit housing by spring clips under sufficient tension to hold the capsule firmly in place during operation, yet light enough to permit easy removal with fingertips. Once removed from the housing, the light capsule provides easy access to the lamps.

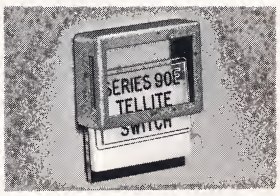
ACTUAL SIZE

ASSEMBLY COMPONENTS



ORDER AS A COMPLETE UNIT ... INCLUDING ENGRAVING!





Filters, Legends Easily Changed as Required!

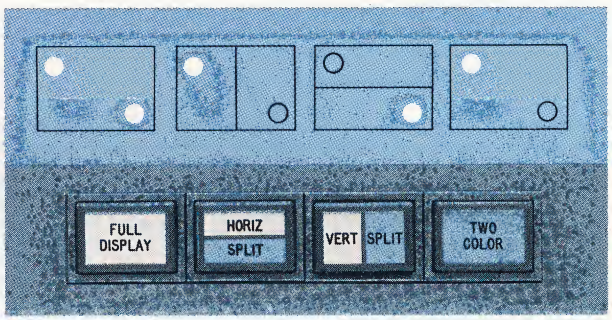
Engraved front lens legends and colored filters can be easily changed from the panel front, without tools of any kind. Having removed the light capsule from the unit housing with fingers only, it is a simple matter to slide the lens holder upward to free the lens, diffuser and color filter. Precision, mating slides with tension locks hold the diffuser, color filter and front lens in captive position when assembled.

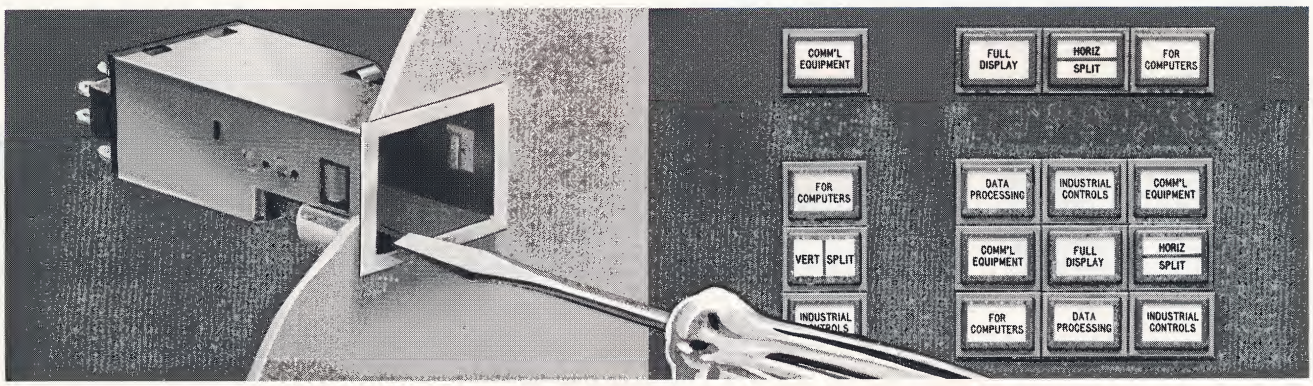
Easy to Mount . . . in Any Type of Grouping!

Infinite flexibility in panel layout arrangements are afforded by the smooth, unobstructed side and top configuration of the Series 90E Tellite Switch. Units can be closely grouped for maximum control in minimum space. Vertical stacks or horizontal rows are readily accomplished in single, elongated panel cutouts as compared to individual cutouts for each unit, saving considerable time and labor cost. Matrix mounting configurations are also possible. Any unit within a group can be installed or removed without disturbing adjacent units. Mounting is accomplished by means of integrated mounting sleeves located in opposite corners of the housing. Turning of screws hidden in the housing causes the sleeves to be drawn into position behind the front panel . . . establishing a hard mount for complete reliability under severe shock and vibration.

VERSATILE LENS DISPLAY ARRANGEMENTS!

In addition to numerous engraving arrangements, the front lens is offered in vertically or horizontally split display screens. The split front lens allows one lamp to illuminate each half of the display, thus providing two indications in the same unit. When used for one-color full display, the second lamp provides extra reliability. A special two-color full display lens is available using one lamp for each color, providing illumination of the entire lens when either lamp is illuminated.



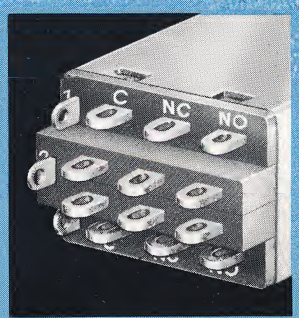


REVERSE ENGRAVED LEGENDS WITHSTAND LONG WEAR!

As with all Master Specialties word indicating switches, legend engraving can be ordered with the unit. No special ordering or special handling necessary. In addition to this convenience, legends are reverse engraved on the back of the lens to protect legends from wear . . . give long service without effacing. A black filler gives optimum visibility.

WIDE CHOICE OF POSITIVE, SNAP-ACTION SWITCH TYPES!

Symmetrically designed Series 90E switches feature simultaneous snap-action switching in both directions, and a double break contact design that results in cooler switching of larger loads, thus increasing electrical life. The switch mechanism and contacts are incorporated as an integral part of the unit housing to reduce switch length to a minimum dimension. Choose from 2PDT or 4PDT switches in momentary or alternate action, or momentary action switches with 6, 12, or 28VDC holding coils for numerous electrical interlock, lock-in or lock-out functions. Switch ratings are 3 amp resistor, 1½ amp induction, 1 amp lamp load.



ALL TERMINALS AT REAR

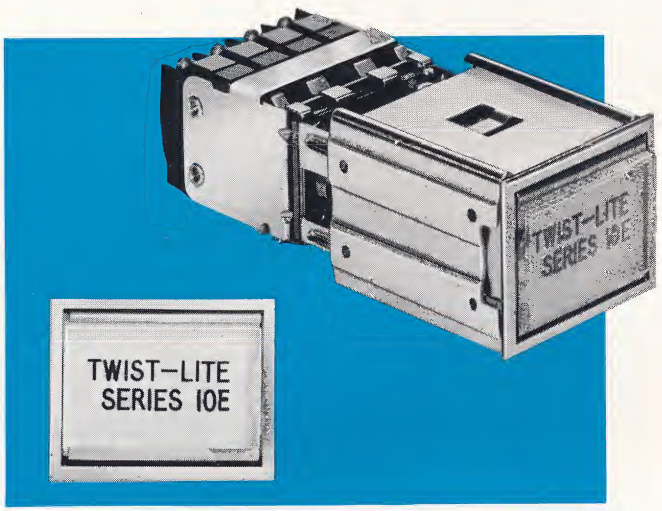
Clean functional design puts all terminals at rear of the unit for ease of assembly. All terminals accept two No. 22 AWG wires, are non-corrosive, gold plated for solderability.

OPTIONAL LAMP VOLTAGES

Choose from 6, 12, or 28 volt type MS-25237 T-1¾ flange base incandescent lamps or special neon lamp assembly for 115V AC applications.

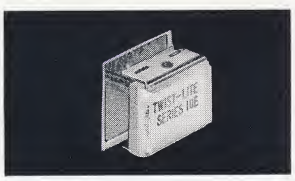
Series 10E Twist-Lite®

A FOUR LAMP ILLUMINATED PUSHBUTTON SWITCH FEATURING POSITIVE HARD MOUNT SLEEVE, INDIVIDUAL LAMP COLOR CONTROL, 4-WAY SPLIT DISPLAY

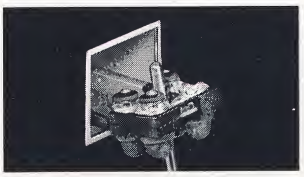


Twist-Lite Series 10E units can be used as illuminated pushbutton switches or as word indicators for design compatibility. Also available with a holding coil for various electrical interlock functions, this series offers complete capability. Four lamp design offers many display opportunities. In operation, depression of the front lens actuates the switch contacts which are available in momentary or alternate action in snap-on assemblies. The special sleeve mount feature of these units provides a positive hard mount particularly suiting the unit to equipment designed for extremes of shock or vibration. Mounting is easily achieved in rows, stacks or matrix configuration.

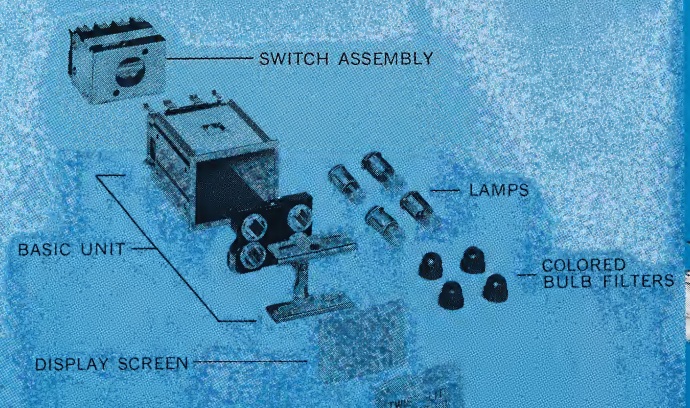
No Tools Required for Relamping, Legend, or Color Filter Change from the Panel Front



FRONT OF PANEL RELAMPING IS EASY
Lamp replacement is accomplished from the panel front without the use of tools and may easily be done without fear of accidental switch actuation. Simply PULL, TWIST and REMOVE for complete access to the lamps.

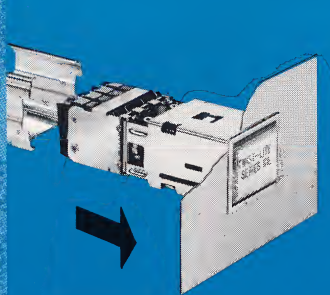


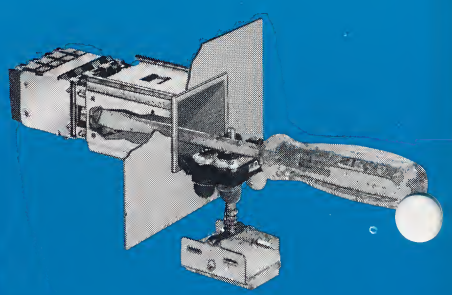
POSITIVE INDEXING
During relamping, the front end assembly remains connected to the unit's housing by two slides. This important feature precludes the possibility of inadvertently transposing the front end assembly with adjacent units.

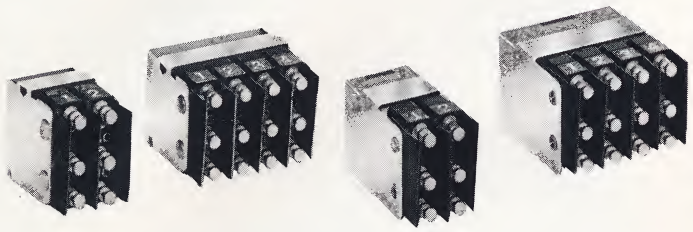


Completely Modular

EASY TO MOUNT
The unit is easily mounted to the panel by installing it from the front of the panel and sliding the mounting cover over the rear of the unit. The two captive mounting screws—accessible from the panel front when the front end assembly is removed—are then tightened with a standard screwdriver, pulling the sleeve tight against panel.





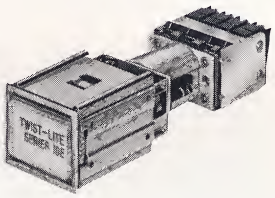


2PDT OR 4PDT REMOVABLE SWITCH ASSEMBLIES

Switch assemblies do not require tools for installation at the rear of the unit housing. Snap-on attachment provides added ease of handling during installation operations. Each switch assembly features 2 or 4 subminiature switches to provide 2PDT or 4PDT contact arrangements in alternate or momentary action.

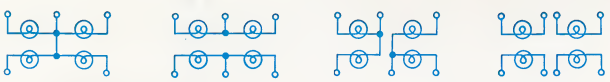
HOLDING COIL UNITS FOR ELECTRICAL INTERLOCK

Numerous electrical interlock, lock-in and lock-out circuits are made possible with the inclusion of a magnetic holding coil with the switch lite unit. Depression of the front lens after the coil has been energized causes the switch contacts to remain actuated until the coil voltage is removed.

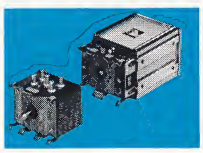


INTERNALLY BUSSED LAMP CIRCUITS REDUCE SOLDERING, SAVE INSTALLATION TIME AND COST

The various lamp circuits for versatile display use are internally bussed to eliminate several soldering operations and provide additional flexibility in design. Typical lamp circuits are pictured below.



OPTIONAL FEATURES



Master Test Control Capsules

Components required for "Master Test" are encapsulated in a control capsule which mounts on the rear of the basic unit housing.

Spacer Barriers

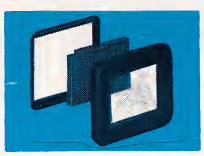
Spacer barriers are available in several colors to provide additional separation between units. Barriers have their own mounts.

RFI Screen

Give added protection against unwanted radiated or conducted RFI passage through the panel cutouts for switching assemblies.

Switch Guard

Easily installed, clear plastic cover hinged at top with spring loaded action provides full protection against inadvertent switch actuation.

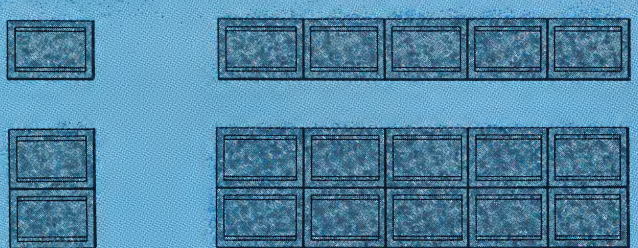


Drip-Proof Seal

An effective guard against liquids or other material entering the unit through panel cutouts.

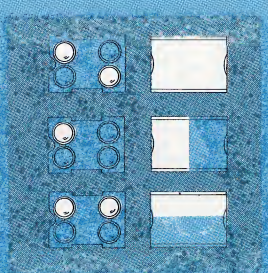
UNLIMITED MOUNTING ARRANGEMENTS

Designers are afforded infinite flexibility in panel layout. Units may be mounted individually with no restrictions as to the space allowed between associated equipment. Stacks and rows can be mounted in elongated cutouts rather than in individual cutouts. Units may be removed or installed without disturbing adjacent units. Matrix mountings are available.



OPTIONAL DISPLAY SCREENS WITH INDIVIDUAL LAMP COLOR CONTROL

Individual lamp color control is provided by silicon rubber filters which fit over each lamp socket. Display screens are available in full, horizontal, vertical and 3 or 4-way split display. 4-lamp capability permits two indications in the same unit or two color operation with the full display screen.

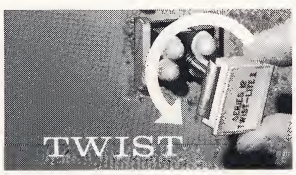


VERSATILE ASSEMBLIES WITH SIMPLIFIED MOUNTING, WIDE SELECTION OF STYLING OPTIONS

Series 12 Twist-Lite II units are illuminated pushbutton switches featuring a simplified spring clip mounting and numerous mounting configurations offering 12 different styling options. Constructed of the highest grade, bright stainless steel, the basic unit can be specified for use as a switch or as an indicator without a switching unit to offer design compatibility in panel design and layout. The four lamp capability and the use of colored silicone rubber boots for individual lamp color control gives complete flexibility in legend display in a choice of full, horizontally or vertically split, three-way and four-way split lenses. The unique Twist-Lite principle permits quick easy removal of the lens assembly for access to lamps, color filters and legends without tools of any kind. The complete versatility of Series 12 units coupled with long-term reliability in operation, contemporary styling and ease of maintenance makes them an ideal choice for industrial, commercial or military control panels.

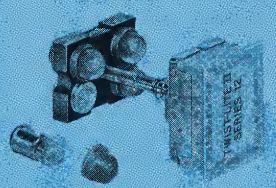
NO TOOLS REQUIRED FOR RELAMPING, LEGEND OR COLOR FILTER CHANGE OR SWITCH MOUNTING

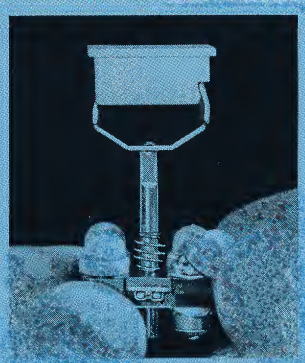
A simple twist lets you remove and return the lens/lamp assembly from the panel front during operation, without tools of any kind and without the hazard of accidental switching, providing complete access to lamps.



PROJECTED COLOR-EASY ACCESS FILTERS

Up to four different colors can be used in one unit, through the use of colored lamp filters that are easily mounted to lamp sockets. The lens is white until illuminated by the desired colored color. Lamp holder design gives ample room for easy modification.





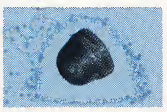
Series 12 Twist-Lite II

4-LAMP SPRING CLIP MOUNTED ILLUMINATED PUSHBUTTON SWITCH OR INDICATOR UNIT

EASY TO MOUNT BARRIER OR SPRING CLIP TYPES WITH SPACERS... 12 MOUNTING OPTIONS FOR DISTINCTIVE PANEL STYLING

Rectangular, flush-mounted Twist-Lites offer three mounting styles, each with two design variations which can be used in vertical or horizontal position, to offer maximum flexibility.

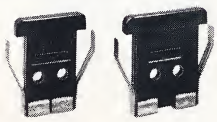
CHOOSE FROM STANDARD LAMPS OR NEON LAMPS TO FIT CIRCUIT NEEDS



Lamps and lamp circuits for two or four type MS25237 T-1 ¾ midget flanged base lamps for operation at 6, 12 or 28 volts or a specially designed neon lamp with current limiting resistor for 115 VAC operation can be specified according to circuit need.

OPTIONAL MOUNTING BARRIERS OR SPACERS

Red, gray, black or white mounting barriers or spacers for horizontal or vertical use can be specified to offer color to complement your design.

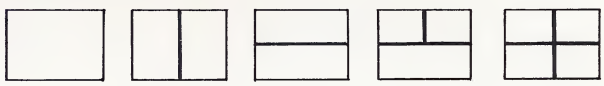


INTERNALLY BUSSED LAMP CIRCUITS SAVE TIME

Internal bussing of common terminals in the various lamp circuits available reduces installation time by reducing soldering operations, results in fewer external wires and connections and a neater, more reliable installation.

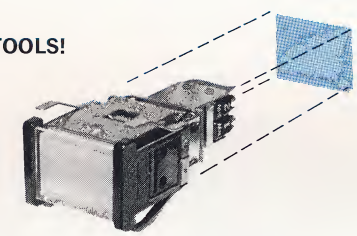
FULL TO FOUR-WAY SPLIT DISPLAY ARRANGEMENTS

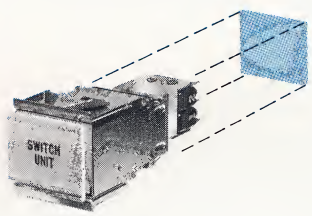
Versatile information display arrangements include a choice of one or two color full lenses, vertically or horizontally split, three way split or four way split configurations. Opaque dividers prevent light leakage from one area of split lenses to the others. Legend engravings can be specified as part of the complete unit.



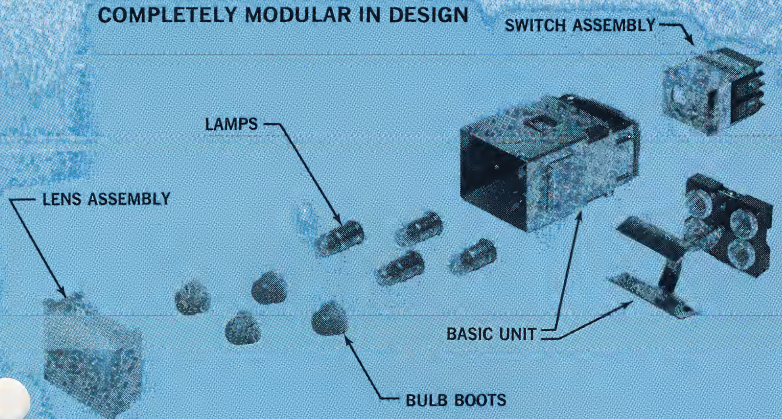
MOUNT FROM PANEL FRONT...WITHOUT TOOLS!

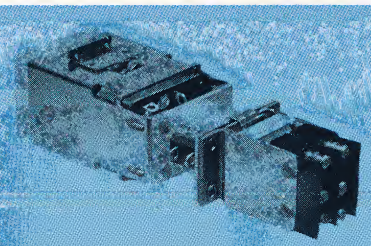
Series 12 units can be mounted singly or in rows, stacks and matrices. Rows and stacks require only one elongated cutout since they can be mounted in intimate contact without interference. Units are held securely by spring clips which are attached to the unit housing or by mounting barriers which hold the units at the sides or top and bottom.





COMPLETELY MODULAR IN DESIGN





WIDE CHOICE OF SWITCH ASSEMBLIES INCLUDING HOLDING COIL UNITS

All switch assemblies snap onto the rear of the basic unit, without tools. Specify 2PDT or 4PDT subminiature switches in momentary or alternate action, rated to 5 amperes at 125-250VAC or 30VDC. Holding coils for various electrical interlock functions are available as part of the basic unit. For complete techincal specifications, request Catalog 2001

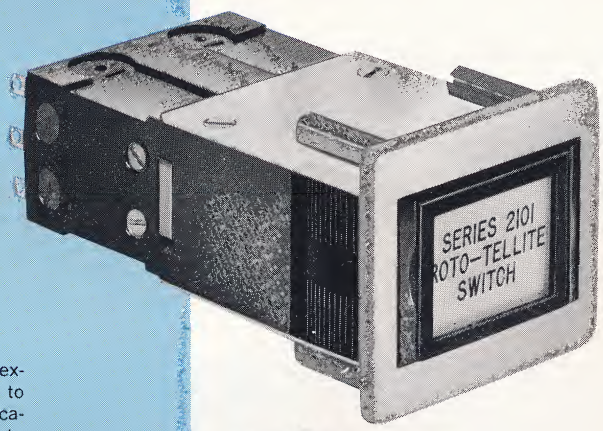
Modular Channel, 4 Lamp, Series 2100
Roto-Tellite Switch

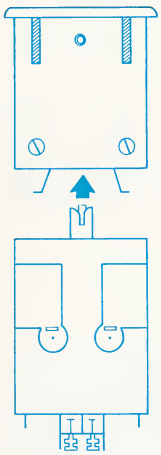
AVAILABLE IN 2PDT OR 4PDT CONTACT ARRANGEMENTS

Switch circuits and operation includes units for momentary action, alternate action, or momentary action with magnetic holding coil for electrical interlock or electrical lock-in, lock-out.

SHORT VERSION

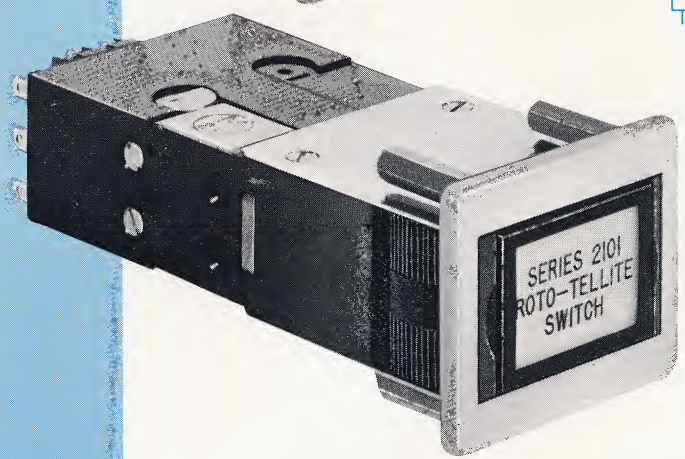
Complete switching units with control circuits for various use of 4-lamps in full, vertically or horizontally split, and three and four way splits.





LONG VERSION

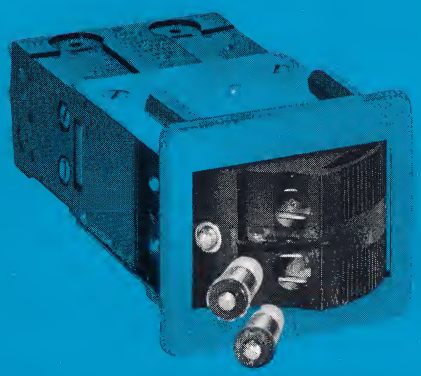
Identical to the short version except for the added circuitry to provide "Master Lamp Verification" as common test, separate test and combinations with blocking diodes.
Actual Size



FLUSH MOUNTED, ILLUMINATED PUSH BUTTON SWITCHES FOR EXACTING MILITARY REQUIREMENTS

Series 2100 Roto-Tellite switches have been designed for rigorous, versatile duty in military and aerospace airborne and ground support equipment. Units are available in a wide variety of channel configurations which permit grouping in many combinations mounted at the factory and delivered ready to install as one unit. Stacks, rows or matrices with lamps, legends and control circuitry can be easily specified by one coded part number with legend engraving included. Units feature the unique Roto-Tellite principle for relamping from the panel front without tools.

ORDER AS A COMPLETE UNIT, INCLUDING LEGEND ENGRAVING

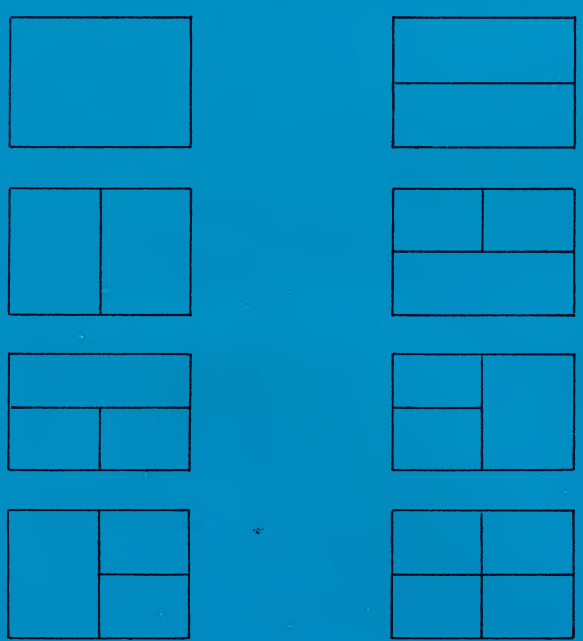


NO TOOLS REQUIRED FOR LAMP REPLACEMENT

The Unique Roto-Tellite principle permits lamp replacement from the panel front without the use of tools, and may be done easily without fear of accidental switch actuation. The rotatable lite capsule which hold the four lamps is unlocked from its normal position by extending the front lens. This allows the capsule to be rotated 180° for access to the lamps. Nothing becomes detached during relamping, therefore eliminating the possibility of inadvertently transposing with adjacent units.

VERSATILE DISPLAY ARRANGEMENTS

In addition to numerous engraved legend arrangements which are available, the front lens is also offered as a vertically, horizontally, and 3 or 4 way split display. The split front lens allows two lamps to illuminate each half of the display, thus providing two indications in the same unit. Two color operation using a full display front lens is also readily accomplished by using two lamps for each color and illuminating one set of lamps at a time.



WIDE RANGE OF LAMP VOLTAGES

Units accept four industry standard type MS-25237 lamps. In addition to the conventional 6, 12 and 28 volt incandescent lamps, a specially developed neon lamp is available which incorporates the required limiting resistor in the base of the lamp assembly. The neon lamp is the same physical size as conventional lamps, draws a nominal current, and is excellent for 115 VAC.

PROJECTED COLOR INCREASE FLEXIBILITY

Prior to illumination, the front lens appears white, with the engraved inscription black. When the lamps are energized, the background appears in color. This allows ease of identification either before or during illumination.

REMOVABLE SWITCH LAMP CONTROL HOUSING

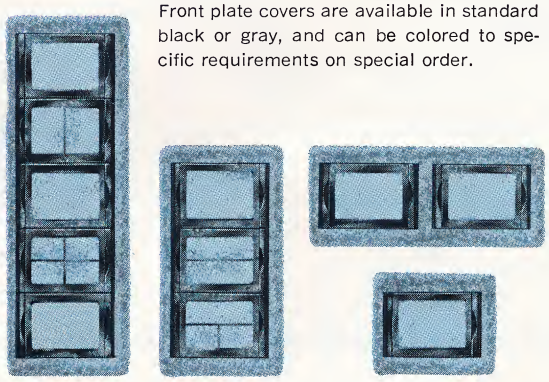
The switch and lamp circuit is mounted in a removable housing, which is securely held to the rear of each lite capsule channel by two captive screws. The same housing is available also with plug-in capsules which provide for "Master Lamp Verification."

EASY TO INSTALL

The unit is easily mounted to the panel by installing from the panel front and then tightening the mounting nuts from the panel backside. All mounting hardware is furnished with the unit.

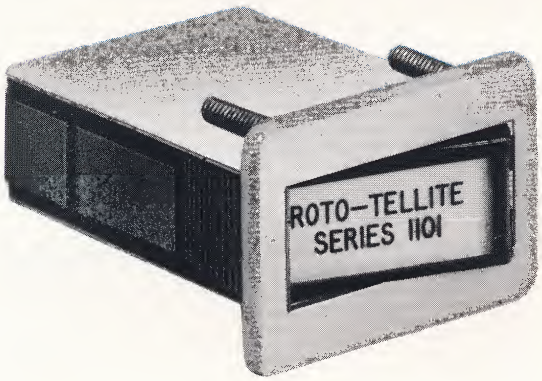
MODULAR CHANNELS FEATURE NUMEROUS GROUPINGS

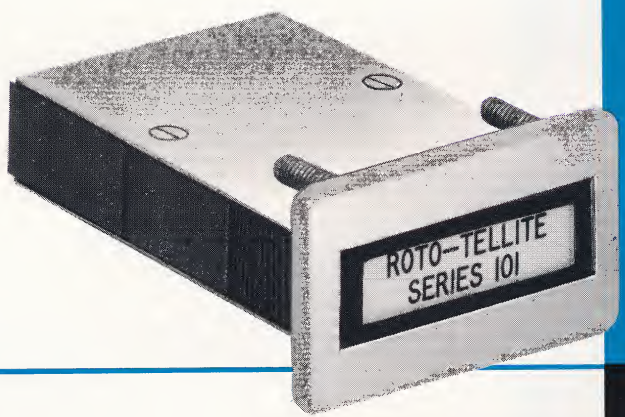
Standard units can be specified singly or in groupings varying from horizontal rows with up to 7 units, vertical stacks up to 5 units per stack, and various groupings of several units vertically and horizontally. Front plate covers are available in standard black or gray, and can be colored to specific requirements on special order.



Series 100 and 1100

Roto-Tellite Word Indicators





NO TOOLS REQUIRED FOR RELAMPING

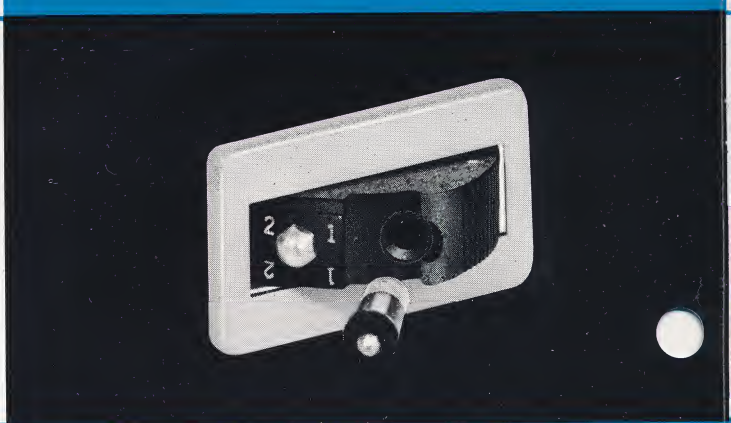
Lamp replacement is accomplished from the panel front, without the use of tools, by depressing one side of the lens face, which causes the lite capsule to rotate. Continuing to rotate 180° exposes the lamps for removal. Nothing becomes detached during relamping, thereby eliminating the possibility of inadvertently transposing with adjacent capsules.

TWO LAMP, FLUSH MOUNTED ILLUMINATED WORD INDICATORS AVAILABLE IN TWO STANDARD LENS SIZES...WIDE VARIETY OF MATRIX CONFIGURATIONS

High reliability word indicators for any application where environmental extremes call for rugged, dependable physical characteristics. Utilizing the unique Roto-Tellite principle for quick, easy lamp replacement from the panel front . . . without tools . . . this unit is ideally suited for airborne or ground support equipment as well as industrial equipment use. Units feature removable control capsules for Master Test, Master Dimming and 115 VAC operation. Modular channel construction offers a wide choice of configurations in stacks, rows and other groupings.

TWO BASIC CHANNEL SIZES

Series 100 units feature a visible legend area measuring 5/16" x 1¼", accommodating up to two 14 character lines of lettering. Series 1100 permits three line legends of 14 characters per line in its 15/32" x 1¼" legend area.



TWO-LAMP FULL SCREEN RELIABILITY OR VERTICAL SPLIT DISPLAY

FULL | VERT | SPLIT

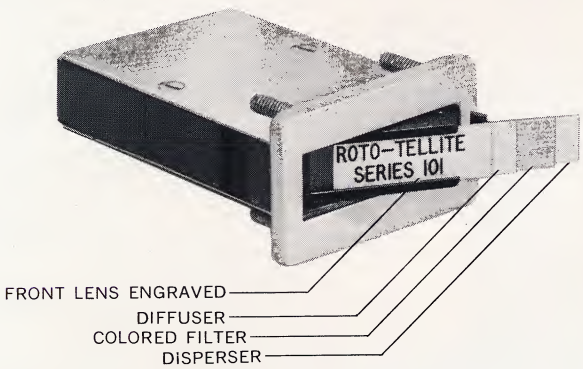
The front lens is available as a full display or split display with lighted letters or lighted backgrounds which may be colored prior to and during illumination, or which may be white prior to illumination and appear in color when illuminated. All lenses are available with the desired engraved inscription. A two-color, full display, utilizing a prism, is also available.

6, 12, 28 VOLT AND 115V NEON LAMP

In addition to the conventional 6, 12 and 28 volt lamps, a special neon lamp is available which has a current-limiting resistor incorporated in its base. This makes it suitable for 115 V.A.C. applications. The high intensity of the lamp furnishes adequate indication brightness when used with amber or red color filters, and is the same physical size as the two industry type MS-25237 incandescent lamps which the units accepts.

NO TOOLS REQUIRED TO REMOVE LENS ASSEMBLY

The front lens may be installed or removed from the lite capsule from the panel front by a hinged gate which, when closed, holds the lens captive within the lite capsule.

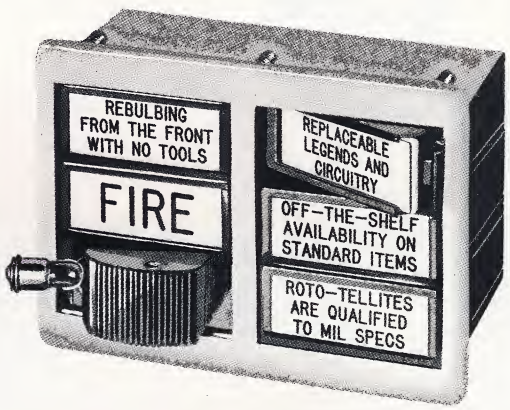


4 LENS TYPES FOR VARIOUS DISPLAY EFFECTS

Standard type letters include: Lighted letters that appear white on black until illuminated, then appear in color: Lighted Background where letters appear black on white background until illuminated, then appears black on colored background; Lighted Letters that are not legible until illuminated and then appear in color; and Lighted Background where letters are not visible until illuminated, become visible on colored background when illuminated.

ORDER AS COMPLETE UNIT, INCLUDING ENGRAVING

Modular Channel construction permits a wide choice of groupings in vertical stacks, horizontal rows and matrix configurations. Optional features such as control capsules, colored filters, lamp types and legend engraving can be ordered at one time to result in a delivered unit ready for installation. The front plate cover for individual units or matrices is available in standard military colors of black and gray, or can be painted to order.

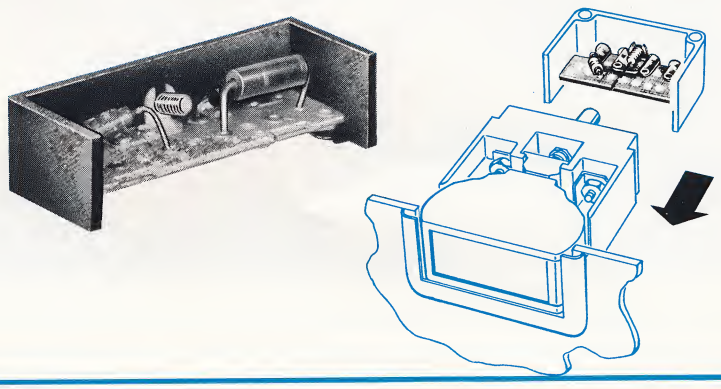


TYPICAL CONFIGURATION

REMOVABLE LAMP CIRCUIT CONTROL CAPSULES

Removable modular control capsules are available for each channel within a mounting unit. These capsules provide maximum design flexibility and contain necessary components for such controls as "Master Test," "Master Dimming" and "115 V.A.C. input with 28 volt lamps."

For complete data, request Catalog 2010.

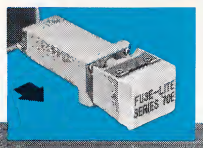


Series 70E Word Indicating Two-Lamp Fuse Holders

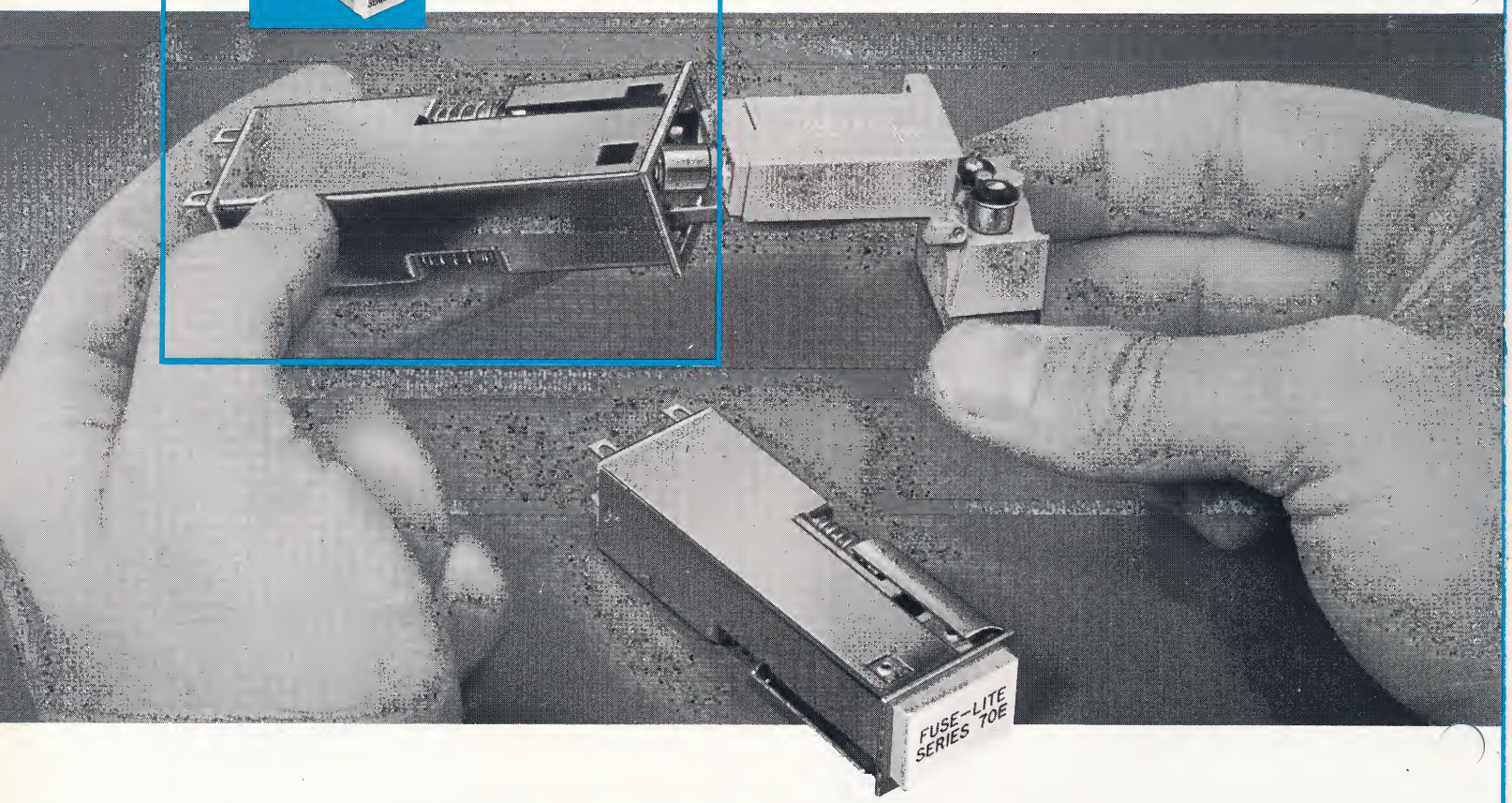
TWO LAMP RELIABILITY IN A MINIATURE ASSEMBLY HOLDING STANDARD FUSES

Series 70E miniature word indicating fuse holders offer a high reliability means for quick identification of open fuses. Unit design provides for quick access to lamps for relamping and to fuses for replacement, from the panel front without tools of any kind. Optional circuits provide a choice in electrical connection and function. Physically rugged, Fuse-Lites are constructed of stainless steel and incorporate a unique design for mounting consisting of mounting sleeves to result in a positive mount without brackets or other hardware to show from the panel front. The illuminated front lens with engraved inscriptions to indicate the protected circuit, plus a choice of color filters for color coding of primary or secondary circuits offers a new concept in fuse condition recognition.

FUSE AND LAMPS ACCESSIBLE FROM PANEL FRONT . . . WITHOUT TOOLS



Fuse or lamp replacement is simply accomplished by removing the front end assembly. Pressing the assembly in and down unlatches the lamp and fuse holder which can then be removed from the housing, to provide access to the lamps or fuse. To re-install, simply press the assembly straight in until it latches to the housing.



DESIGNED FOR USE IN COMMERCIAL, INDUSTRIAL AND MILITARY POWER PLANTS AND TEST EQUIPMENT

REMOVABLE LENS AND COLOR FILTER REMOVABLE LENS AND COLOR FILTER

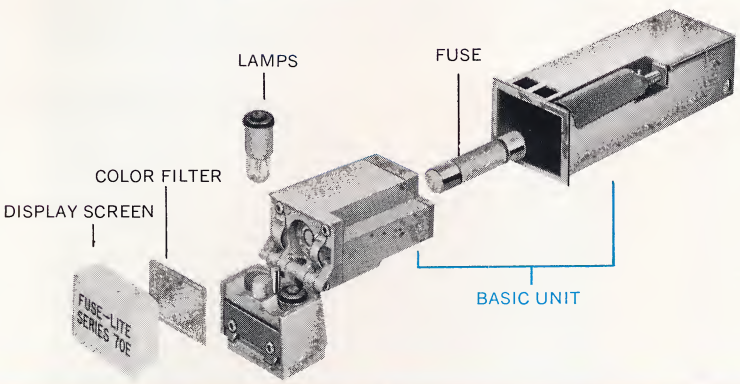
The front lens can be removed by removing the lamp and fuse holder from the panel, then sliding the front lens upwards. This permits change of the filter which will be held captive between the lens and holder when re-installed.

6, 12, 28 VOLT LAMPS OR 115V NEON LAMPS

Units accept two industry type MS-25237 lamps for 6, 12, or 28 volt operation. For 115 VAC applications, a specially developed neon lamp which incorporates a limiting resistor in the lamp base can be specified.

UP TO FOUR LINES OF LEGEND PER UNIT

Horizontally mounted units provide space for three lines of 9 character legend. Mounted vertically, a Fuse-Lite will accommodate four lines of six characters each per line. Engraved front lenses are black-filled for legibility.



TWO BASIC CIRCUITS FOR DESIGN

Resistance Limiter Circuit

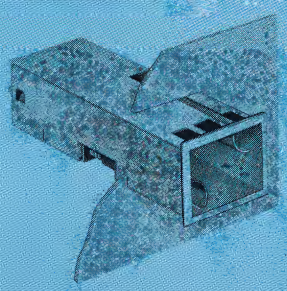
This circuit uses a standard ¼" x 1¼" fuse and is rated to 125 volts, up to 20 amperes. it features lamps in parallel with the fuse so that they are energized when the fuse "opens."

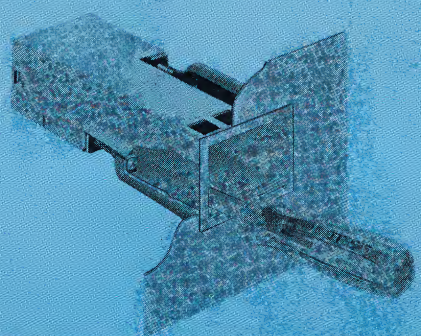
Isolated Lamp/Fuse Circuit

This circuit uses the GLD type pop-out fuse, allows the lamp voltage and current to be completely isolated from the fused circuit, permitting the use of separate power supplies or different voltages. Two-lamp reliability is provided in either case to assure illuminated word indication when a fuse opens.

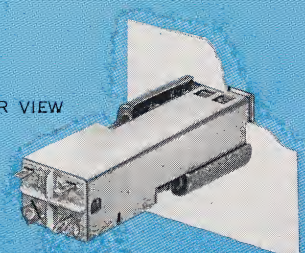
SELF-CONTAINED MOUNTING. NO HARDWARE OR BRACKETS

Unique housing design eliminates the need for loose hardware or brackets since mounting sleeves are an integral part of the housing. To mount, the front end assembly must be removed to gain access to mounting screw heads located in opposite corners of the housing. Turning of the screws cams the mounting sleeves into position to contact the rear of the panel. When drawn tight, the sleeve provides a positive mount. For electrical connection, all terminals are conveniently located at the unit rear.



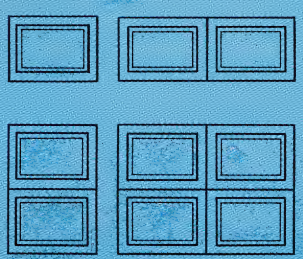


REAR VIEW



UNLIMITED MOUNTING ARRANGEMENTS

Units may be mounted with no restrictions as to room required between the Fuse-Lite and other equipment. Vertical stacks and horizontal rows can be mounted in elongated cutouts rather than in individual cutouts for each unit. When mounted, any unit can be removed and re-installed without disturbing adjacent units. Matrix mounts are possible without space between units.



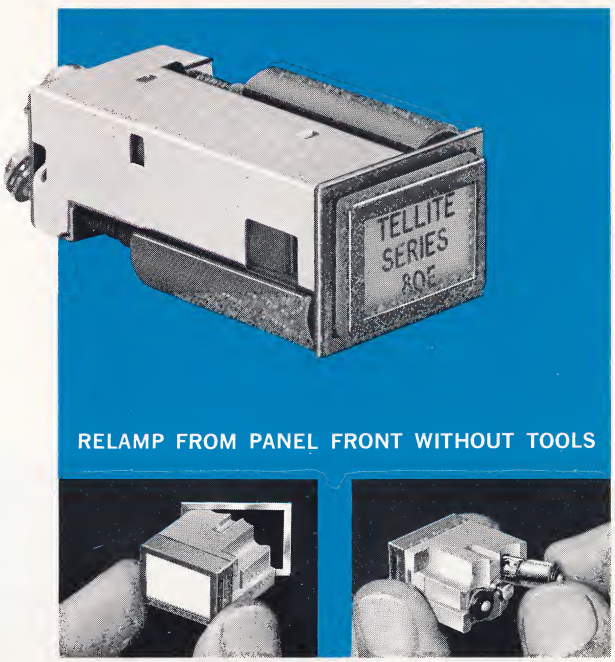
ORDER AS A COMPLETE UNIT INCLUDING ENGRAVED LEGENDS AND STANDARD LAMPS

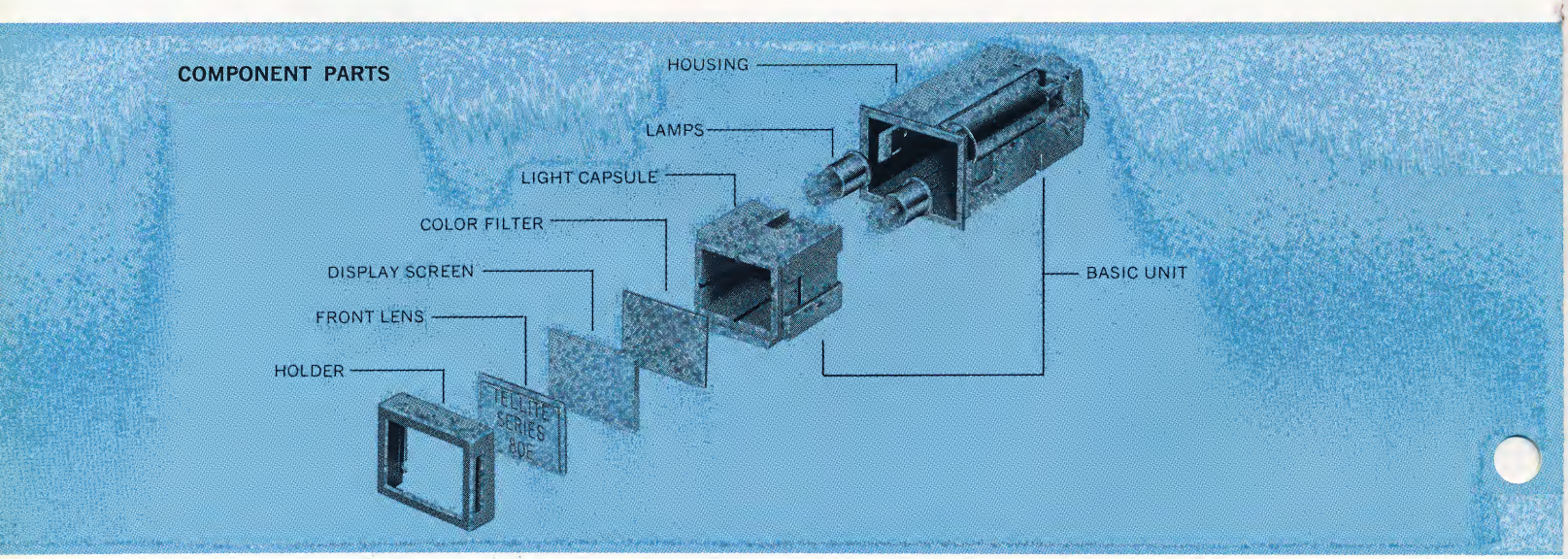
Tellite

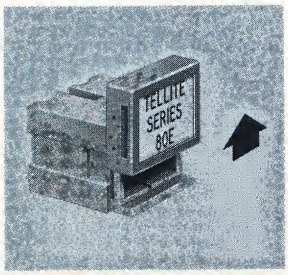
Series 80E Two-Lamp Pilot Light

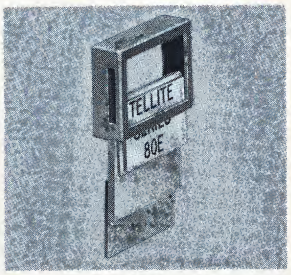
WORD INDICATING PILOT LIGHT FOR 2-LAMP RELIABILITY OR TWO DIFFERENT LIGHTED INDICATIONS

Tellite is a two-lamp flush mounted pilot light. The two lamps, connected in parallel, provide for two-lamp reliability or allow for two separate lighted indications within one unit. The clear front lens carries a reverse-engraved legend which presents highly legible characters and permits cleaning of the lens and long-term use without effacing the legend. A translucent display screen evenly diffuses the light across the entire front lens. Variations in background color are achieved through the use of slab type color filters can provide a different color in each part of the display with no light leakage between displays because of the unique divider arrangement. A prismatic arrangement to provide for full display in each of two distinct colors is also available. Lamps and/or lens assemblies can be installed or removed from the panel front without the use of tools of any kind. Mounting is positive and is accomplished from the panel front without special brackets or additional hardware.







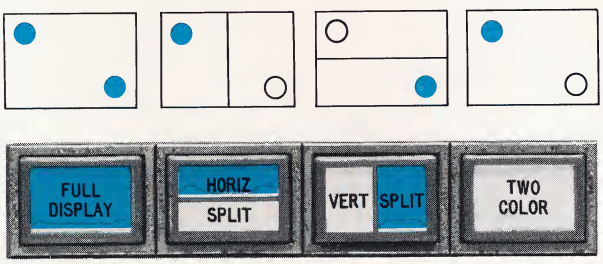


REMOVABLE LENS ASSEMBLY PROVIDES EASY ACCESS TO LEGENDS AND COLORED FILTERS

The front lens, which may be engraved for identification of the function being monitored, is securely held to the lite capsule by mating slides and may be removed by sliding the two part. This allows replacement of the lens or colored filter which is held captive between the two parts.

FULL OR SPLIT DISPLAY-PROJECTED COLOR

Display lenses are available in vertically or horizontally split configurations. The split front lens allows one lamp to illuminate each half of the display, to provide two indications in the same unit. A special two color full display lens is available which uses one lamp for each color to provide illumination of the entire lens when either lamp is illuminated.

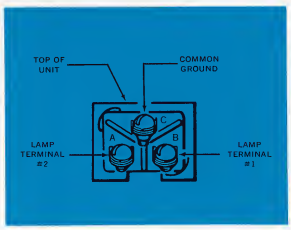


OPTIONAL LAMP VOLTAGES AND TYPES

The voltage range includes 6, 12, and 28 volt lamps. The Master Specialties light capsule unit accepts two industry type MS-25237 lamps. In addition, a specially developed neon lamp which incorporates the required limiting resistor in the base of the lamp is available. Nominal current is drawn and the neon lamp is an excellent application for 115 V.A.C. The neon lamp is the same physical size as the conventional lamp and illuminates red or amber with a sharp legibility of the inscription.

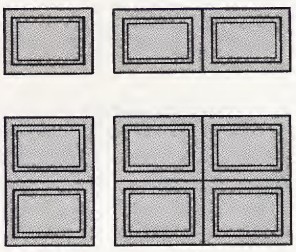
COMBINATION TERMINALS

Lamp terminals are at the rear of the unit for easy access, and are combination screw or solder type providing the advantage of utilizing the most desirable method for the particular installation.



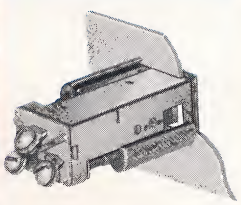
VERSATILE MOUNTING ARRANGEMENTS

Units can be mounted singly or in rows or stacks without concern over the distance between Tellites and other equipment. Elongated panel cutouts are used rather than single cutouts. Once mounted, any unit can be removed and reinstalled without disturbing adjacent units. Matrix mountings are also possible.

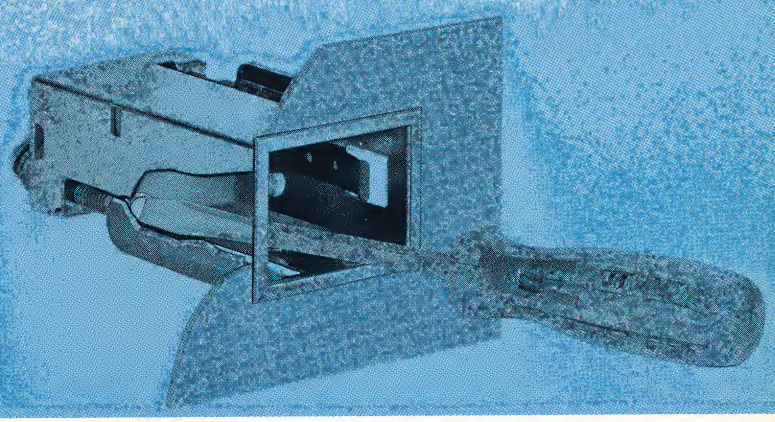


SELF-CONTAINED MOUNTING SLEEVE PERMITS POSITIVE MOUNT WITHOUT EXTRA HARDWARE

Mounting sleeves are an integral part of the main housing. Turning of screws in opposite corners of the housing cams the sleeves into position to contact and draw up against the panel back. Hard mounting is attained, yet no screwheads show from the panel front and no special brackets are required. Mounting is completely within the front face outline dimensions of the unit.

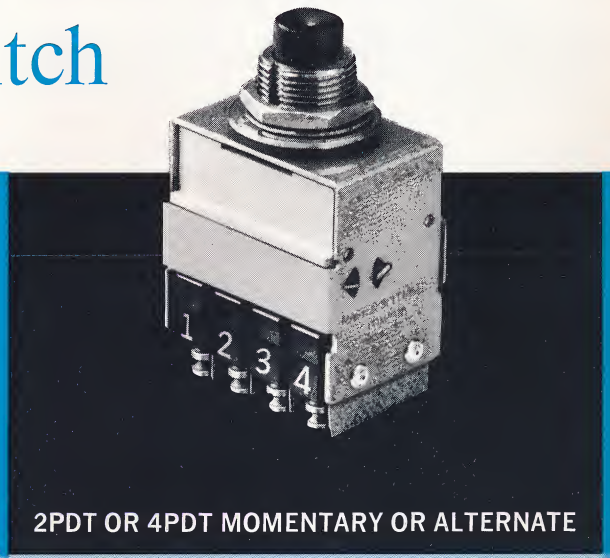


POSITIVE HARDMOUNT



For complete specifications, request Catalog 2006.

Series 14 Precision Panel Mount
Pushbutton Switch



2PDT OR 4PDT MOMENTARY OR ALTERNATE

POSITIVE SNAP-ACTION OPERATION PROHIBITS "TEASE"

Series 14 panel-mount switch assemblies feature a positive snap-action design that assures instantaneous contact transfer to prohibit "tease" operation and provides a strong tactile indication of switch action. The detent force requirement for switching requires deliberate action, prevents accidental switching. Designed and produced to military specifications, Series 14 switches offer high performance and long life to all military, industrial and commercial applications.

DESIGN FEATURES

Positive Transfer: Force required to switch is sufficient to prevent accidental switching, provides tactile indication.

Concave Surface Buttons: Fit finger-tip. Prevent slipping. Available in black or red color.

Plated Terminals: Increases solderability.

Double-Turret Terminals. Designed to accept two #20 wires.

Universal Mount: Fits standard diameter hole in panels up to 3/16" thick. All hardware for mounting supplied with unit.

Enclosed Switch Mechanism: Protects mechanism. Inhibits dust and dirt collection.

Identified Switch Modules: Large, legible numbers for quick identification.

Flexible Switch Insulators: Teflon impregnated fiberglass material. Non-Flammable. Produces no offensive odor when subject to high temperatures during soldering operations.

All Stainless Steel and Plastic Parts: For any environment.

PERFORMANCE CHARACTERISTICS

Operating Force: 3 to 5 lbs. maximum.

Contact Arrangements: 2PDT or 4PDT, alternate or momentary action.

Switch Ratings: **Silver Contact—**
Rated for 5 amps at 125 or 250 VAC
3 amps inductive or 5 amps resistive at 30 VDC.
Gold Contacts—
½ amp inductive or 1 amp resistive at 30 VDC.

Electrical Life: 25,000 cycles at full rated load.

Mechanical Life: 50,000 cycles.

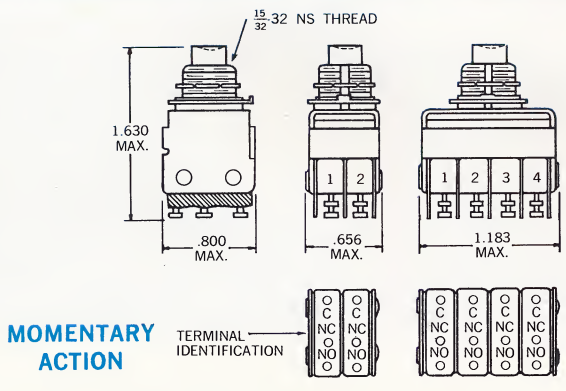
Shock: Per Mil-Std-202, Method 202, 50G.

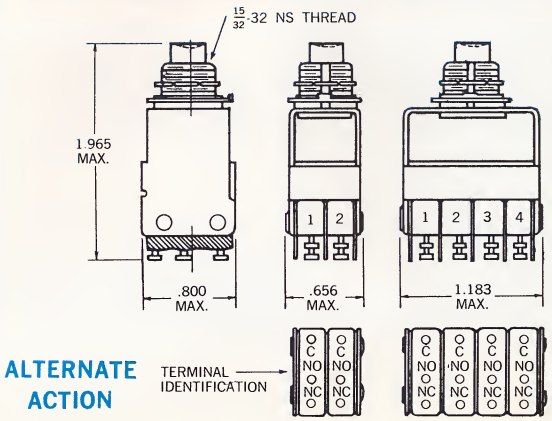
Vibration: Per Mil-Std-202, Method 204, Condition A.

Dielectric: 1,000 volts at sea level for one minute.

Operating Temperature Range: —55°C to +85°C.

Weight: 2PDT ALT; 0.060 lbs. Max.
4PDT ALT: 0.100 lbs. Max.
2PDT MOM: 0.055 lbs. Max.
4PDT MOM: 0.075 lbs. Max.





Series 16 Precision
Toggle Switch Assemblies

2PDT OR 4PDT MAINTAINED/MAINTAINED

SIMULTANEOUS TRANSFER OF ALL SWITCH CONTACTS

A new switch design featuring precision, virtually simultaneous transfer of all switch module contacts within a unit. Contacts of all switches transfer within a 1° segment of the toggle lever 34° travel arc. Coupled with a force requirement that precludes accidental switching, and a positive full-travel lever action that prohibits "tease" operation, this series offers new performance standards to toggle switch applications in any equipment. Designed and produced to military specifications.

SPECIFICATIONS

Alternate Action: Maintained in either position.

Contact Arrangement: 2PDT or 4PDT.

Switch Ratings: Silver Contacts—
5 amps at 125 or 250 VAC.
3 amps inductive at 30 VDC.
5 amps resistive at 30 VDC.

Gold Contacts:—
½ amp inductive at 30 VDC.
1 amp resistive at 30 VDC.

Electrical Life: 25,000 cycles at full rated load.

Mechanical Life: 50,000 cycles.

Shock: Per Mil-Std-202, Method 202: 50G.

Vibration: Per Mil-Sts. 202, Method 204: Condition A.

Dielectric: 1,000 volts at sea level for one minute.

Operating Temperature Range: —55°C to +85°C.

Weight: 0.070 lbs. max for 2PDT.
0.090 lbs. max for 4PDT.

DESIGN FEATURES

Gold or Silver Switch Contacts: Specify silver for general use . . . gold for low energy (dry) circuits.

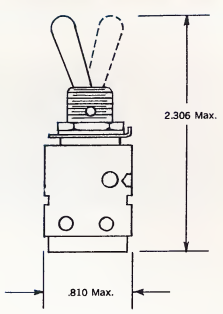
Universal Anti-Rotation Mount: Mount in panels to 3/16" thick in standard hole. All hardware including anti-rotation washer supplied with unit.

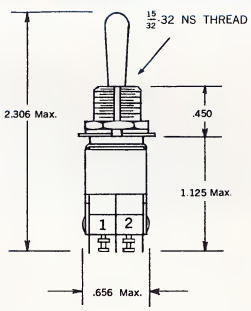
Identified Switch Modules: Marked on front, back and bottom for quick identification during assembly.

Double-Turret Terminals: Long plated terminals for high solderability. Accepts two wires.

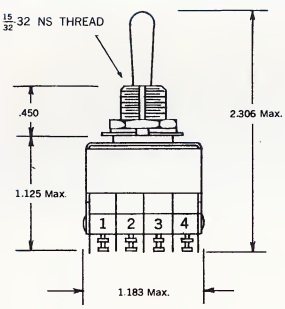
Flexible, No Burn/No Odor Switch Insulators: Teflon impregnated fiberglass insulators will not burn or release offensive odors during soldering operations.

Environmental Resistant Stainless Steel and Plastic throughout.

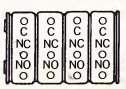




TWO POLE / DOUBLE THROW



FOUR POLE / DOUBLE THROW



DIMENSIONS

ALTERNATE ACTION MOMENTARY ACTION

Tolerance: ±0.015 except as noted.

Phase Sequence Sensors...

Indicators and Relays

PHASE SEQUENCE RELAYS

Protect Vulnerable Circuits. . . .
Prevent Damage from Incorrect Phase Sequence

Master Specialties Phase Sequence Relays automatically monitor three-phase power . . . block current of incorrect phase sequence from entering vulnerable circuitry. The relay picks up only if all terminals are energized and the phase sequence is A-B-C, drops out if terminals are opened or sequence changes to C-B-A. Ideal for preventing three-phase motors from running backwards.

SPECIFICATIONS:

Contact Ratings Available:
1. 3 amp resistive, 1 amp inductive at 28 VDC or 115 VAC at 400 CPS.
2. 2 amp resistive, 1 amp inductive at 28 VDC or 115 VAC at 400 CPS.
3. 10 amp resistive, 5 amp inductive at 28 VDC or 115 VAC at 400 CPS.

Power Consumption: 10 Watts, Maximum.

Resistance: 0.08 ohm, Maximum.

Contact Resistance: 0.08 ohm, Maximum.

Insulation Resistance: 100 megohms, minimum, between terminals and case, and between open contacts.

Dielectric Strength: 1000 V.R.M.S., 60 C.P.S. between terminals and case, and 500 V.R.M.S., 60 C.P.S. between open contacts.

Ambient Temperature Range: —55°C to +71°C.

Panel Mounted Monitor of Three-Phase Power. . . .

PHASE SEQUENCE INDICATORS

Solid state indicator for permanent installation on panels to warn of incorrect sequence of three-phase power. Unit remains illuminated when all input terminals are energized and the phase sequence is A-B-C, will not illuminate when one or more power input terminals are open or if the phase sequence is C-B-A. A unique resistance-capacitance sensing network drives a neon lamp for lifetime operation without rebulbing or adjustment.

SPECIFICATIONS:

R.M.S. Voltage Range	C.P.S. Frequency Range
105-135	54-66
180-220	54-66
215-265	54-66
430-530	54-66
105-135	320-480
180-220	320-480

Power Consumption: 2 Watts.

Ambient Temperature: —55°C to +125°C.

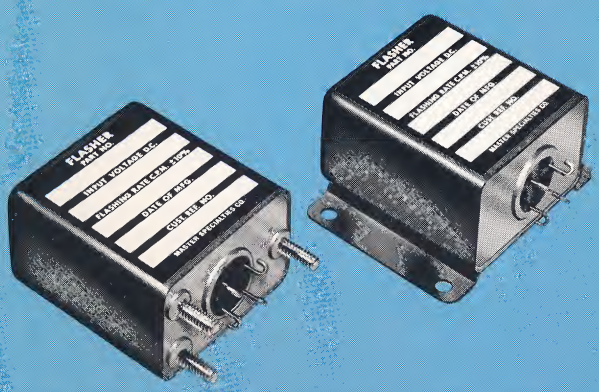
For complete technical data, request Catalog 2020

Solid-State and Relay Flashers

WIDE VARIETY OF MOUNTING CONFIGURATIONS, FLASHING RATES AND ON : OFF RATIOS

SERIES 500

Solid-State Flashers



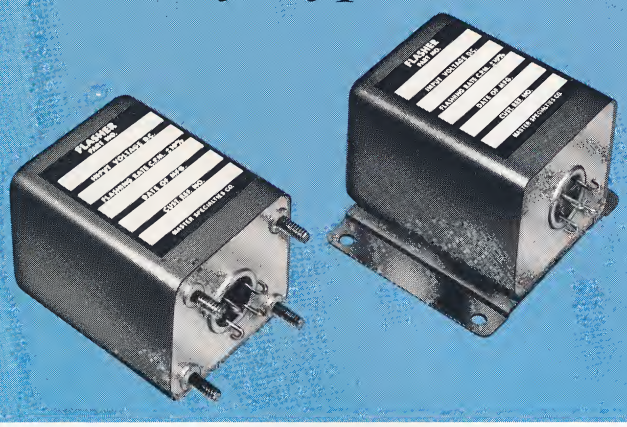
Provide More Than 10 Million Cycles of Trouble-Free Operation Over Wide Temperature Range

Series 500 Flashers have been designed to provide more than 10 million cycles of trouble-free operation over a wide voltage and temperature range. The miniaturized Series 500 Flashers consist of solid-state, transistorized circuitry incorporating the highest quality components, hermetically sealed to assure maximum performance and reliability under rugged physical and environmental conditions.

A wide variety of mounting configurations, flashing rates, and on:off ratios are available and easily specified by coded part numbers.

SERIES 600

Relay Type Flashers



Solid-State Flasher Circuit and Relay Within One Hermetically Sealed Housing

Series 600 Relay Type Flashers, have been designed for maximum reliability in ground support, and critical industrial equipment... wherever caution or warning lights are used. Units consist of a transistorized control circuit which operates the contacts of a relay housed within the same hermetically sealed can.

The operating temperature range is − 55°C to + 71°C. Stability of the flashing rate for a change from + 25°C to any ambient temperature within the specified range, and with any input voltage within specified limits, is ± 10%. Life expectancy is 500,000 cycles minimum.

Versatile mounting configurations, output rating, flashing rates and on:off ratios.

For complete technical data, request Catalog 2019.

FACTORY PRE-SET OR ADJUSTABLE

Series 700 Time Delay Relays

ACCURACY TO ±5% IN DELAY TIME INTERVALS WITHIN THE RANGE OF 0.050 TO 90 SECONDS, WITH ±2% REPEAT ACCURACY

ALL SOLID STATE CIRCUITRY

Series 700 Time Delay Relays have been designed to provide highly accurate and reliable operation in military, industrial and commercial equipment. Configurations are available for delayed pull-in operation in a variety of mounting and header arrangements. Individual units are comprised of a solid-state timing network for long-term reliability, and a relay. Both are hermetically sealed in one housing for protection from environmental extremes.

Accuracies of ±10% and ±5% on delay time are enhanced by a ±2% repeat accuracy stability of the solid-state network. Time delay intervals can be pre-set or can be adjustable internally by means of a built-in potentiometer or externally through the use of a timing resistor.

Life of 100,000 cycles minimum at full rated load is assured in temperatures ranging from −55°C to +85°C.

OPERATION

The timing cycle starts upon application of 18 to 32 VDC. At the end of the predetermined time interval, the relay contacts will transfer and remain transferred until the input power is removed.

DELAY TIME VALUES

Delay time may be specified for pre-set values at any point within the range of 0.050 to 90 seconds. Adjustable units are available for ranges of: 0.05 to .500 sec.; 0.350 to 1 sec.; 0.750 to 15 sec. and 5 to 90 seconds.

MOUNTING CONFIGURATIONS

Available with studs for panel mount or flange and tabs for chassis mounting.

SPECIFICATIONS

Input Voltage: 18 to 32 VDC

Power Requirement: 4 WATTS at 32 VDC. 3 Amp Units.
6 WATTS at 32 VDC. 10 Amp Units.

Dielectric Strength: 1,000 V.R.M.S., 500 V.R.M.S. across pin Contacts

Insulation Resistance: 100 Megohms Minimum

Reset Time: 0.050 Seconds Maximum

Contact Ratings:

3 Amp Unit { 3 Amps Resistive at 28 VDC or 115 VAC
1 Amp Inductive at 28 VDC or 115 VAC

10 Amp Unit { 10 Amps Resistive at 28 VDC or 115 VAC
5 Amp Inductive at 28 VDC or 115 VAC

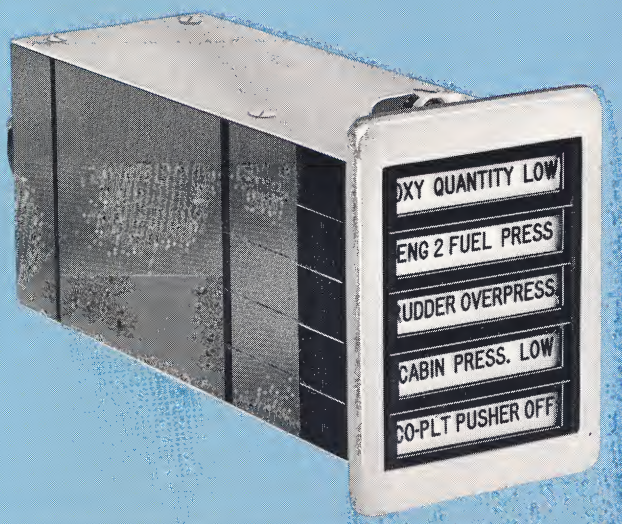
Vibration: 20G's at 10 to 2,000 cycles per second.

Shock: 100G's for 11 Milliseconds.

For Detail Specifications:
On the time delay relay, request Catalog #2021

Master Caution Systems

COMPLETE SYSTEMS, CUSTOM DESIGNED AND PRODUCED TO MEET EXACTING MILITARY REQUIREMENTS



Master Specialties "Master Caution Systems" offer a complete warning system for monitoring of several functions, providing a positive identification of system faults by means of illuminating word indications.

Utilizing Roto-Tellite Word Indicators, systems can include any number of units which are matrix mounted in one compact unit containing various control circuits as required by the application. Such added functions as "Master Test" and "Master Dimming" can be included. The highly reliable system features all of the operational advantages of the Roto-Tellite design, including front relamping without tools, and quick, easy change of legends and color filters from the panel front . . . without tools.

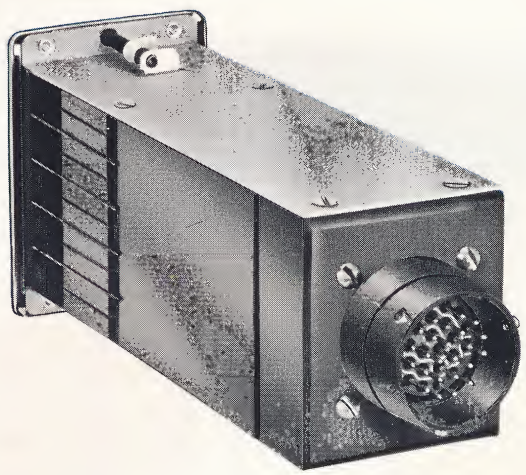
Master Specialties "Master Caution Systems" have been widely used in prominent military and commercial aircraft of today as well as in missile ground support equipment. They represent the most advanced and reliable warning systems of their type.

OPERATION

Any fault in a monitored system or circuit will energize the Master Caution Light, which can be a flashing light or steady light, whichever preferred. Simultaneously, the Roto-Tellite unit monitoring the circuit will illuminate to provide a word indication of the circuit involved. When the warning has been acknowledged, the Master Caution Light can be turned off by pressing reset button, however the word indicating Roto-Tellite will remain illuminated until the fault has been corrected. Should another fault signal be received before the first fault has been corrected, the Master Caution Light will illuminate again and the indicator for the second circuit will also illuminate. By re-setting the Master Caution Light after each warning, attention is called to any succeeding fault arising in the system.

In the event of a fault of short duration that corrects itself, the unit's self-resetting feature will automatically turn out the Master Caution Light without requiring manual re-setting.

For further information on the features of Master Caution Systems, Contact your Master Specialties Field Engineer.



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Master Specialties Company

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TELEX 6-74667

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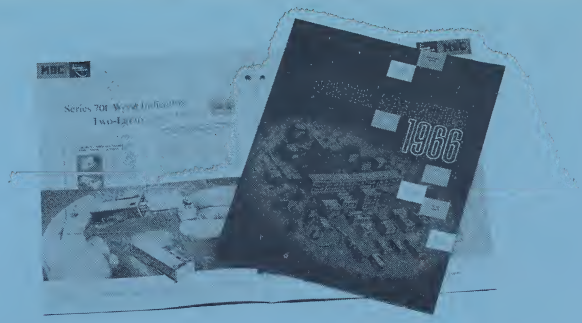
Here is your copy of the MSC 1966 Short Form Catalog!



IF YOU HAVE A SPECIFIC APPLICATION, we will be happy to send a complete file of engineering information and data catalogs pertaining to your project. Simply complete the questionnaire below, fold the card with the reply side out, staple or tape it closed and drop it in the mail. No postage is required.

☐ YES, I HAVE A SPECIFIC APPLICATION. Please send complete catalogs and engineering data related to the application of:

IF THERE ARE ANY INACCURACIES IN YOUR NAME OR ADDRESS PLEASE INDICATE THE CORRECTIONS.

(So that we can send all data pertinent to your design needs, please supply the following information.)

MY EXACT TITLE IS: _____

MY JOB FUNCTION IS: _____

MY TELEPHONE NO. IS: _____ EXT. _____

I AM PERSONALLY INTERESTED IN ☐ WORD INDICATOR LIGHTS ☐ ILLUMINATED PUSH-BUTTON SWITCHES ☐ INDICATING FUSE HOLDERS ☐ PILOT LIGHTS ☐ PUSH-BUTTON SWITCHES ☐ TOGGLE SWITCHES ☐ TIME DELAY RELAYS ☐ PHASE SEQUENCE SENSORS ☐ FLASHERS.

MY SPECIFIC APPLICATION IS: _____

THE EQUIPMENT IS PRIMARILY FOR: ☐ MILITARY/SPACE PROGRAMS ☐ INDUSTRIAL CONTROLS ☐ CONSUMER APPLIANCES ☐ COMMERCIAL COMPUTERS/DATA PROCESSING ☐ OTHER _____

The Buyer in Purchasing to whom you should send current pricing information on your products is: _____

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